

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
3 June 2004 (03.06.2004)

PCT

(10) International Publication Number  
**WO 2004/047253 A1**

(51) International Patent Classification<sup>7</sup>: **H02K 3/28**

(21) International Application Number:  
PCT/AU2003/001495

(22) International Filing Date:  
13 November 2003 (13.11.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
2002952687 15 November 2002 (15.11.2002) AU

(71) Applicant (for all designated States except US): **IN MOTION TECHNOLOGIES** [AU/AU]; 4/7 Weddell St, Parap, Darwin, Northern Territory 0820 (AU).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **PATTERSON, Dean, James** [AU/US]; 103 Paces Brook Avenue, #10332, Columbia, SC 29212 (US). **KENNEDY, Byron, John**

[AU/AU]; 4/7 Weddell St, Parap, Darwin, Northern Territory 0820 (AU). **CAMILLERI, Steven, Peter** [AU/AU]; 6 Coorong Court, Stuart Park, Darwin, Northern Territory 0820 (AU). **GUYMER, Benjamin, David** [AU/AU]; 11/77 Sir Fred Schonell Drive, St Lucia, Brisbane, Queensland 4067 (AU). **GREAVES, Matthew, Campbell** [AU/AU]; 11/77 Sir Fred Schonell Drive, St Lucia, Brisbane, Queensland 4067 (AU).

(74) Agent: **KENNEDY, Byron, John**; 4/7 Weddell St, Parap, Darwin, Northern Territory 0820 (AU).

(81) Designated States (*national*): AU, CA, CN, JP, NO, NZ, SG, US, ZA.

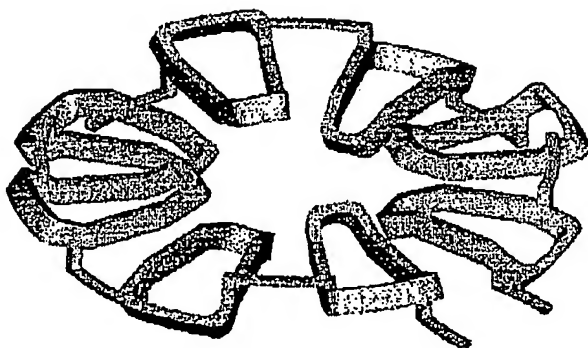
(84) Designated States (*regional*): European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR).

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: POLY-PHASE ELECTROMAGNETIC DEVICE HAVING AN IMPROVED CONDUCTOR WINDING ARRANGEMENT



(57) Abstract: A poly-phase electromagnetic device having  $n$  winding phases ( $n > 2$ ) wherein each phase is made from a single conductor strand wound in a lap form configuration. The windings are configured such that on assembly to a slotted magnetically conductive base a maximum of  $n-1$  end turns overlapping is achieved so that the slot packing density can be optimised. The preferred configurations also enable neat and compact terminations which facilitates efficient packaging of the completed device. The windings are made either from discrete bobbins which are electrically interconnected upon assembly to the base, or alternatively from strings of continuously formed sub-windings. The latter process in particular enables full or partial automation of the winding and/or assembly process.

WO 2004/047253 A1